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09/443,516

(FILE 'HOME' ENTERED AT 17:01:24 ON 10 APR 2002)

FILE 'MEDLINE, BIOTECHDS, EMBASE, BIOSIS, SCISEARCH, CANCERLIT, CAPLUS'
ENTERED AT 17:13:39 ON 10 APR 2002

L1 416 S HELGESON J?/AU OR AUSTIN-PHILLIPS S?/AU OR NAESS S?/AU
L2 950 S LATE (S) BLIGHT (S) RESIST?
L3 257 S L2 AND POTATO (S) PLANT#
L4 188 S SOLANUM BULBOCASTANUM OR BULBOCASTANUM
L5 1010046 S CHROMOSOM##
L6 19834 S RAPD OR CT88 RFLP OR CT148 RFLP OR CT252 RFLP OR CT68 RFLP
L7 2991 S SOFT ROT
L8 32805 S ERWINIA OR VERTICILL?
L9 1550445 S TRANSFORM?
L10 16369 S SOMATIC (S) HYBRIDI?
L11 457986 S VECTOR
L12 10 S LATE BLIGHT RESISTANCE GENE
L13 22 S L1 AND L2
L14 257 S L2 AND L3
L15 13 S L4 AND L14
L16 13 S L14 AND L6
L17 4 S L16 AND L8
L18 6 S L13 AND L6
L19 1 S L16 AND L9
L20 0 S L16 AND L11
L21 1 S L16 AND L12
L22 10 S L1 AND L12
L23 5 DUP REM L12 (5 DUPLICATES REMOVED)
L24 13 DUP REM L13 (9 DUPLICATES REMOVED)
L25 7 DUP REM L16 (6 DUPLICATES REMOVED)
L26 2 DUP REM L17 (2 DUPLICATES REMOVED)
L27 3 DUP REM L18 (3 DUPLICATES REMOVED)
L28 5 DUP REM L22 (5 DUPLICATES REMOVED)
L29 10 S L24 AND L4
L30 10 DUP REM L29 (0 DUPLICATES REMOVED)
L31 4 S L25 AND L4
L32 3 S L31 AND L1
L33 0 S SCHUMANN ?/AU AND L4

FILE 'AGRICOLA, BIOBUSINESS, BIOCOMMERCE, BIOSIS, BIOTECHNO, CABA,
CAPLUS, CBNB, CIN, CONFSCI, CROPB, CROPU, ESBIODASE, FOMAD, FOREGE,
FROSTI, FSTA, GENBANK, IFIPAT, INVESTEXT, LIFESCI, NAPRALERT, NTIS,
PASCAL, PHIC, PHIN, PROMT, SCISEARCH, USPATFULL, ...' ENTERED AT

17:35:50

ON 10 APR 2002

L34 818 S L1
L35 2925 S L2
L36 493 S L4
L37 15 S L12
L38 6 S L35 AND L36 AND L9
L39 0 S L35 AND L36 AND L10 AND L11
L40 30 S L35 AND L36 AND L6
L41 39 S 40 AND L1
L42 7 DUP REM L40 (23 DUPLICATES REMOVED)

=>

13:39 ON 10 APR 2002

L1 416 S HELGESON J?/AU OR AUSTIN-PHILLIPS S?/AU OR NAESS S?/AU
L2 950 S LATE (S) BLIGHT (S) RESIST?
L3 257 S L2 AND POTATO (S) PLANT#
L4 188 S SOLANUM BULBOCASTANUM OR BULBOCASTANUM
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L14 257 S L2 AND L3
L15 13 S L4 AND L14
L16 13 S L14 AND L6
L17 4 S L16 AND L8
L18 6 S L13 AND L6
L19 1 S L16 AND L9
L20 0 S L16 AND L11
L21 1 S L16 AND L12
L22 10 S L1 AND L12
L23 5 DUP REM L12 (5 DUPLICATES REMOVED)
L24 13 DUP REM L13 (9 DUPLICATES REMOVED)
L25 7 DUP REM L16 (6 DUPLICATES REMOVED)
L26 2 DUP REM L17 (2 DUPLICATES REMOVED)
L27 3 DUP REM L18 (3 DUPLICATES REMOVED)
L28 5 DUP REM L22 (5 DUPLICATES REMOVED)
L29 10 S L24 AND L4
L30 10 DUP REM L29 (0 DUPLICATES REMOVED)
L31 4 S L25 AND L4
L32 3 S L31 AND L1

L30 ANSWER 1 OF 10 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.
ACCESSION NUMBER: 2001:165877 BIOSIS
DOCUMENT NUMBER: PREV200100165877
TITLE: Partial resistance to *Phytophthora infestans* in four
Solanum crosses.
AUTHOR(S): Dorrance, A. E. (1); Inglis, D. A.; Helgeson, J. P.
; Brown, C. R.
CORPORATE SOURCE: (1) OARDC, The Ohio State University, Wooster, OH, 44691:
dorrance.1@osu.edu USA
SOURCE: American Journal of Potato Research, (January February,
2001) Vol. 78, No. 1, pp. 9-17. print.
ISSN: 1099-209X.

DOCUMENT TYPE: Article
LANGUAGE: English
SUMMARY LANGUAGE: English; Spanish

AB Thirty progeny from each of four *Solanum* crosses were evaluated in the field at Mount Vernon, WA, in 1996 and 1997 for partial **resistance** to *Phytophthora infestans*. Of the four parents, three have high levels of partial **resistance** to *P. infestans*; one derived from somatic hybridization of *S. bulbocastanum*, the other two from traditional breeding efforts for multiple disease **resistance**. Data were collected from each cross to estimate area under the disease progress curve (AUDPC), days to 5% disease severity threshold (DT5), and sporangia production (SP). All of these variables differed significantly among the progeny within each cross in each year. Correlation analysis indicated that DT5 was highly correlated with AUDPC for all four populations for both years. Log-transformed SP was significantly ($P < 0.001$)

correlated to AUDPC values for one population in both years, but the significance of the correlation was variable between years for the remaining three crosses. The variable DT5, which is composed of three components (infection efficiency, latent period, and lesion growth rate), was the most important in identifying progeny with partial **resistance to late blight** in all four crosses in this study.

L30 ANSWER 2 OF 10 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.
ACCESSION NUMBER: 2001:47758 BIOSIS
DOCUMENT NUMBER: PREV200100047758
TITLE: Development and applications of a set of
chromosome-specific cytogenetic DNA markers in potato.
AUTHOR(S): Dong, F.; Song, J.; Naess, S. K.; Helgeson,
J. P.; Gebhardt, C.; Jiang, J. (1)
CORPORATE SOURCE: (1) Department of Horticulture, University of
Wisconsin-Madison, Madison, WI, 53706:
jjiangl@facstaff.wisc.edu USA
SOURCE: Theoretical and Applied Genetics, (November, 2000) Vol.
101, No. 7, pp. 1001-1007. print.
ISSN: 0040-5752.

DOCUMENT TYPE: Article
LANGUAGE: English
SUMMARY LANGUAGE: English

AB Reliable and easy to use techniques for chromosome identification are critical for many aspects of cytogenetic research. Unfortunately, such techniques are not available in many plant species, especially those with a large number of small chromosomes. Here we demonstrate that fluorescence in situ hybridization (FISH) signals derived from bacterial artificial chromosomes (BACs) can be used as chromosome-specific cytogenetic DNA

25
1.2
0.5
0.2
0.1

markers for chromosome identification in potato. We screened a potato BAC library using genetically mapped restriction fragment length polymorphism markers as probes. The identified BAC clones were then labeled as probes for FISH analysis. A set of 12 chromosome-specific BAC clones were isolated and the FISH signals derived from these BAC clones serve as convenient and reliable cytological markers for potato chromosome identification. We mapped the 5S rRNA genes, the 45S rRNA genes, and a potato **late blight resistance** gene to three specific potato chromosomes using the chromosome-specific BAC clones.

L30 ANSWER 3 OF 10 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.

ACCESSION NUMBER: 2001:22065 BIOSIS

DOCUMENT NUMBER: PREV200100022065

TITLE: **Resistance to late blight in Solanum bulbocastanum** is mapped to chromosome 8.

AUTHOR(S): **Naess, S. K.**; Bradeen, J. M.; Wielgus, S. M.; Haberalach, G. T.; McGrath, J. M.; **Helgeson, J. P.** (1)

CORPORATE SOURCE: (1) Plant Disease Resistance Research Unit, Department of Plant Pathology, USDA/ARS, University of Wisconsin, Madison, WI, 53706: JPH@plantpath.wisc.edu USA

SOURCE: Theoretical and Applied Genetics, (October, 2000) Vol. 101,

No. 5-6, pp. 697-704. print.

ISSN: 0040-5752.

DOCUMENT TYPE: Article

LANGUAGE: English

SUMMARY LANGUAGE: English

AB Somatic hybrids between potato and **Solanum bulbocastanum**, a wild diploid ($2n=2x=24$) Mexican species, are highly **resistant to late blight**, caused by *Phytophthora infestans*. Both randomly amplified polymorphic DNA (RAPD) and restriction fragment length polymorphism (RFLP) markers that are closely linked to the **resistance** have been noted by analysis of three different backcross-2 populations derived from two different somatic hybrids. With reference to previously published potato and tomato maps, **resistance** appears to be on the long arm of chromosome 8 and is flanked by RFLP markers CP53 and CT64. In a population of BC2 plants derived from a cross between the BC1 line J101K6 ((*S. tuberosum* PI 203900+*S. bulbocastanum* PI 243510) XKatahdin)XAtlantic, **late blight resistance** cosegregated with RFLP marker CT88 and RAPD marker OPG02-625.

L30 ANSWER 4 OF 10 BIOTECHDS COPYRIGHT 2002 DERWENT INFO AND ISI

ACCESSION NUMBER: 1999-05649 BIOTECHDS

TITLE: **New late blight resistance** potato plant; produced by recombinant expression of **Solanum bulbocastanum late blight-resistance** gene in potato transgenic plant

AUTHOR: **Helgeson J P**; Austin S; **Naess S K**

PATENT ASSIGNEE: Wisconsin-Alumni-Res.Found.

LOCATION: Madison, WI, USA.

PATENT INFO: WO 9905903 11 Feb 1999

APPLICATION INFO: WO 1998-US15910 27 Jul 1998

PRIORITY INFO: US 1997-54267 30 Jul 1997

DOCUMENT TYPE: Patent

LANGUAGE: English

OTHER SOURCE: WPI: 1999-153343 [13]

AN 1999-05649 BIOTECHDS
AB A **late blight-resistant** potato plant
(*Solanum tuberosum*) transgenic containing a region of a genome from
Solanum bulbocastanum which contains a **blight**
-resistance gene is claimed. Also claimed is a nucleic acid
complementary to all or part of a ds molecule having 1 of 3 given DNA
sequences, and a vector containing that nucleic acid. The claims also
cover a means of monitoring **late blight-**
resistance in a breeding cross of the progeny of a fertile
somatic hybrid of *Solanum tuberosum* and *S. bulbocastanum*. This
involves crossing the two *Solanum* sp., isolating genomic DNA and
detecting a genetic marker, that is associated with **late**
blight disease-**resistance**. Also covered is a means of
identifying a *S. bulbocastanum* gene by cloning a DNA region
associated with the **late blight-resistance**
phenotype of the *Solanum bulbocastanum* x *tuberosum*
cross, and using it to isolate clones of a *S. bulbocastanum*
genomic library, allowing identification of **late blight**
-resistance genes. The claims extend to a **late**
blight-resistance gene identified in this manner, and a
transgenic plant containing that gene. This is used to produce
late blight resistant potato transgenic
plants. (40pp)

L30 ANSWER 5 OF 10 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.
ACCESSION NUMBER: 1999:407483 BIOSIS
DOCUMENT NUMBER: PREV199900407483
TITLE: Toward mapping and cloning **late blight**
resistance derived from the wild *Solanum*
bulbocastanum using potato + *S.*
bulbocastanum somatic hybrids.
AUTHOR(S): Bradeen, James M. (1); Ness, S. Kristine (1); Haberlach,
Geraldine T. (1); Wielgus, Susan M. (1); **Helgeson,**
John P. (1)
CORPORATE SOURCE: (1) Department of Plant Pathology, USDA-ARS, University of
Wisconsin, 1630 Linden Drive, Madison, WI, 53706 USA
SOURCE: Hortscience, (June, 1999) Vol. 34, No. 3, pp. 533-534.
Meeting Info.: 96th Annual International conference of the
American Society for Horticultural Science Minneapolis,
Minnesota, USA July 27-31, 1999 American Society for
Horticultural Science
. ISSN: 0018-5345.
DOCUMENT TYPE: Conference
LANGUAGE: English

L30 ANSWER 6 OF 10 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.
ACCESSION NUMBER: 1998:352549 BIOSIS
DOCUMENT NUMBER: PREV199800352549
TITLE: Somatic hybrids between *Solanum*
bulbocastanum and potato: A new source of
resistance of late blight.
AUTHOR(S): **Helgeson, J. P. (1)**; Pohlman, J. D.; Austin, S.;
Haberlach, G. T.; Wielgus, S. M.; Ronis, D.; Zambolim, L.;
Tooley, P.; McGrath, J. M.; James, R. V.; Stevenson, W. R.
CORPORATE SOURCE: (1) USDA/ARS Plant Disease Resistance Res. Unit, Dep.
Plant
Pathology, Univ. Wis., Madison, WI 53706 USA
SOURCE: Theoretical and Applied Genetics, (May, 1998) Vol. 96, No.
6-7, pp. 738-742.
ISSN: 0040-5752.

DOCUMENT TYPE: Article
LANGUAGE: English

AB **Solanum bulbocastanum**, a wild, diploid ($2n = 2x = 24$) Mexican species, is highly **resistant** to *Phytophthora infestans*, the fungus that causes **late blight** of potato. However this 1 EBN species is virtually impossible to cross directly with potato. PEGmediated fusion of leaf cells of **S. bulbocastanum** PI 245310 and the tetraploid potato line **S. tuberosum** PI 203900 ($2n = 4x = 48$) yielded hexaploid ($2n = 6x = 72$) somatic hybrids that retained the high **resistance** of the **S. bulbocastanum** parent. RFLP and RAPD analyses confirmed the hybridity of the materials. Four of the somatic hybrids were crossed with potato cultivars Katahdin or Atlantic. The BC1 progeny segregated for **resistance** to the US8 genotype (A-2 mating type) of *P. infestans*. **Resistant** BC1 lines crossed with susceptible cultivars again yielded populations that segregated for **resistance** to the fungus. In a 1996 field-plot in Wisconsin, to which no fungicide was applied, two of the BC1 lines, from two different somatic hybrids, yielded 1.36 and 1.32 kg/plant under a severe **late-blight** epidemic. In contrast, under these same conditions the cultivar Russet Burbank yielded only 0.86 kg/plant. These results indicate that effective **resistance** to the **late-blight** fungus in a sexually incompatible *Solanum* species can be transferred into potato breeding lines by somatic hybridization and that this **resistance** can then be further transmitted into potato breeding lines by sexual crossing.

L30 ANSWER 7 OF 10 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.
ACCESSION NUMBER: 1997:329209 BIOSIS
DOCUMENT NUMBER: PREV199799628412
TITLE: **Resistance of late blight in four Solanum populations.**
AUTHOR(S): Dorrance, A. E. (1); Inglis, D. A. (1); **Helgeson, J. P.**; Brown, C. R.
CORPORATE SOURCE: (1) WSU-REU, Mount Vernon, WA 98273 USA
SOURCE: Phytopathology, (1997) Vol. 87, No. 6 SUPPL., pp. S25.
Meeting Info.: Annual Meeting of the American Phytopathological Society Rochester, New York, USA August 9-13, 1997
ISSN: 0031-949X.
DOCUMENT TYPE: Conference; Abstract
LANGUAGE: English

L30 ANSWER 8 OF 10 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.
ACCESSION NUMBER: 1996:553816 BIOSIS
DOCUMENT NUMBER: PREV199699276172
TITLE: Multiple site tests of **resistance to late blight of Solanum bulbocastanum** -potato somatic hybrids and their progeny.
AUTHOR(S): **Helgeson, J. P.**; Haberlach, G. T.; McGrath, J.-M.; James, R. V.; Stevenson, W. R.
SOURCE: American Potato Journal, (1996) Vol. 73, No. 8, pp. 362.
Meeting Info.: 80th Annual Meeting of the Potato Association of America Idaho Falls, Idaho, USA August 11-15, 1996
ISSN: 0003-0589.
DOCUMENT TYPE: Conference
LANGUAGE: English

L30 ANSWER 9 OF 10 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.
ACCESSION NUMBER: 1996:14815 BIOSIS

DOCUMENT NUMBER: PREV199698586950
TITLE: **Resistance to late blight and early blight** in potato cultivars and breeding lines.
AUTHOR(S): James, R. V. (1); Stevenson, W. R.; **Helgeson, J. P.**
CORPORATE SOURCE: (1) Dep. Plant Pathol., Univ. Wisconsin-Madison, Madison, WI 53706 USA
SOURCE: Phytopathology, (1995) Vol. 85, No. 10, pp. 1195.
Meeting Info.: Annual Meeting of the American Phytopathological Association Pittsburgh, Pennsylvania, USA
August 12-16, 1995
ISSN: 0031-949X.
DOCUMENT TYPE: Conference
LANGUAGE: English

L30 ANSWER 10 OF 10 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.
ACCESSION NUMBER: 1996:92551 BIOSIS
DOCUMENT NUMBER: PREV199698664686
TITLE: **Late blight and early blight resistance** from somatic hybrids between **Solanum bulbocastanum** and potato.
AUTHOR(S): **Helgeson, John P.**; James, R. Vaughan; Stevenson, Walter R.
SOURCE: American Potato Journal, (1995) Vol. 72, No. 10, pp. 629.
Meeting Info.: 79th Annual Meeting of the Potato Association of America Bangor, Maine, USA July 23-27, 1995
ISSN: 0003-0589.
DOCUMENT TYPE: Conference
LANGUAGE: English

ANSWER 1 OF 5 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.DUPLICATE 1

ACCESSION NUMBER: 2001:47758 BIOSIS
DOCUMENT NUMBER: PREV200100047758
TITLE: Development and applications of a set of
chromosome-specific cytogenetic DNA markers in potato.
AUTHOR(S): Dong, F.; Song, J.; Naess, S. K.; Helgeson, J. P.;
Gebhardt, C.; Jiang, J. (1)
CORPORATE SOURCE: (1) Department of Horticulture, University of
Wisconsin-Madison, Madison, WI, 53706:
jjiangl@facstaff.wisc.edu USA
SOURCE: Theoretical and Applied Genetics, (November, 2000) Vol.
101, No. 7, pp. 1001-1007. print.
ISSN: 0040-5752.
DOCUMENT TYPE: Article
LANGUAGE: English
SUMMARY LANGUAGE: English
AB Reliable and easy to use techniques for chromosome identification are
critical for many aspects of cytogenetic research. Unfortunately, such
techniques are not available in many plant species, especially those with
a large number of small chromosomes. Here we demonstrate that
fluorescence
in situ hybridization (FISH) signals derived from bacterial artificial
chromosomes (BACs) can be used as chromosome-specific cytogenetic DNA
markers for chromosome identification in potato. We screened a potato BAC
library using genetically mapped restriction fragment length polymorphism
markers as probes. The identified BAC clones were then labeled as probes
for FISH analysis. A set of 12 chromosome-specific BAC clones were
isolated and the FISH signals derived from these BAC clones serve as
convenient and reliable cytological markers for potato chromosome
identification. We mapped the 5S rRNA genes, the 45S rRNA genes, and a
potato late blight resistance gene
to three specific potato chromosomes using the chromosome-specific BAC
clones.

L23 ANSWER 2 OF 5 CAPLUS COPYRIGHT 2002 ACS

ACCESSION NUMBER: 2000:858278 CAPLUS
DOCUMENT NUMBER: 135:148008
TITLE: Resistance to late blight in Solanum bulbocastanum is
mapped to chromosome 8
AUTHOR(S): Naess, S. K.; Bradeen, J. M.; Wielgus, S. M.;
Haberlach, G. T.; McGrath, J. M.; Helgeson, J. P.
CORPORATE SOURCE: USDA/ARS Plant Disease Resistance Research Unit,
Department of Plant Pathology, University of
Wisconsin, Madison, WI, 53706, USA
SOURCE: Theoretical and Applied Genetics (2000), 101(5-6),
697-704
CODEN: THAGA6; ISSN: 0040-5752
PUBLISHER: Springer-Verlag
DOCUMENT TYPE: Journal
LANGUAGE: English
AB Somatic hybrids between potato and Solanum bulbocastanum, a wild diploid
(2n=2x=24) Mexican species, are highly resistant to late blight, caused
by
Phytophthora infestans. Both randomly amplified polymorphic DNA (RAPD)
and restriction fragment length polymorphism (RFLP) markers that are
closely linked to the resistance have been noted by anal. of three
different backcross-2 populations derived from two different somatic
hybrids. With ref. to previously published potato and tomato maps,
resistance appears to be on the long arm of chromosome 8 and is flanked
by

RFLP markers CP53 and CT64.
REFERENCE COUNT: 35 THERE ARE 35 CITED REFERENCES AVAILABLE FOR
THIS
RECORD. ALL CITATIONS AVAILABLE IN THE RE
FORMAT

L23 ANSWER 3 OF 5 BIOTECHDS COPYRIGHT 2002 DERWENT INFO AND ISI

ACCESSION NUMBER: 1999-05649 BIOTECHDS

TITLE: New late blight resistance potato plant;
produced by recombinant expression of Solanum
bulbocastanum **late blight-**
resistance gene in potato transgenic
plant

AUTHOR: Helgeson J P; Austin S; Naess S K

PATENT ASSIGNEE: Wisconsin-Alumni-Res.Found.

LOCATION: Madison, WI, USA.

PATENT INFO: WO 9905903 11 Feb 1999

APPLICATION INFO: WO 1998-US15910 27 Jul 1998

PRIORITY INFO: US 1997-54267 30 Jul 1997

DOCUMENT TYPE: Patent

LANGUAGE: English

OTHER SOURCE: WPI: 1999-153343 [13]

AN 1999-05649 BIOTECHDS

AB A late blight-resistant potato plant (Solanum tuberosum) transgenic
containing a region of a genome from Solanum bulbocastanum which
contains

a blight-resistance gene is claimed. Also claimed is a nucleic acid
complementary to all or part of a ds molecule having 1 of 3 given DNA
sequences, and a vector containing that nucleic acid. The claims also
cover a means of monitoring late blight-resistance in a breeding cross
of

the progeny of a fertile somatic hybrid of Solanum tuberosum and S.
bulbocastanum. This involves crossing the two Solanum sp., isolating
genomic DNA and detecting a genetic marker, that is associated with late
blight disease-resistance. Also covered is a means of identifying a S.
bulbocastanum gene by cloning a DNA region associated with the late
blight-resistance phenotype of the Solanum bulbocastanum x tuberosum
cross, and using it to isolate clones of a S. bulbocastanum genomic
library, allowing identification of late blight-resistance genes. The
claims extend to a **late blight-resistance**
gene identified in this manner, and a transgenic plant containing
that gene. This is used to produce late blight resistant potato
transgenic plants. (40pp)

L23 ANSWER 4 OF 5 BIOTECHDS COPYRIGHT 2002 DERWENT INFO AND ISI

ACCESSION NUMBER: 1987-10726 BIOTECHDS

TITLE: Somatic hybrids between Solanum brevidens and Solanum
tuberosum: expression of a **late blight**
resistance gene and potato-leaf-roll
resistance;
disease-resistance; crop improvement (conference
abstract)

AUTHOR: Helgeson J P; Hunt G J; Haberlach G T; Ehlenfeldt M; Austin
S

LOCATION: USDA, ARS, University of Wisconsin, Madison, WI 53706, USA.

SOURCE: Int.Congr.Plant Tissue Cell Cult; (1986) 6 Meet., 386

DOCUMENT TYPE: Journal

LANGUAGE: English

AN 1987-10726 BIOTECHDS

AB Hexaploid somatic hybrids resulting from mesophyll protoplast fusions

between *Solanum brevidens* Phil., PI 218228, and *Solanum tuberosum* L. (potato), PI 203900 were tested for late blight resistance using 2 races of *Phytophthora infestans* Monte., de Bary. The *S. tuberosum* parent was

a

late blight differential possessing the R4 gene which confers resistance to race 0. The *S. brevidens* parent is resistant to potato-leaf-roll virus. Inoculations with both compatible (race 1.3.4.5) and

incompatible

(race 0) races of *P. infestans* clearly demonstrated the expression of the

late blight resistance gene in all of the hybrid progeny tested. Most of the hybrids tested were also resistant to potato-leaf-roll virus (PLRV), indicating that the *S. brevidens* genes for PLRV resistance were present and expressed. Some of these fusion hybrids are fertile and crosses were made with *S. tuberosum* cultivars. Preliminary results on the expression of the R4 resistance gene in the sexual progeny were presented. (0 ref)

L23 ANSWER 5 OF 5 BIOTECHDS COPYRIGHT 2002 DERWENT INFO AND ISI

ACCESSION NUMBER: 1986-10828 BIOTECHDS

TITLE: Somatic hybrids between *Solanum brevidens* and *Solanum tuberosum*: expression of a **late blight resistance gene** and potato leaf roll resistance;

potential potato crop improvement

AUTHOR: Helgeson J P; Hunt G J; Haberlach G T; Austin S

LOCATION: United States Department of Agriculture, University of Wisconsin, 1630 Linden Drive, Madison, WI 53706, USA.

SOURCE: Plant Cell Rep.; (1986) 5, 3, 212-14

CODEN: PCRPD8

DOCUMENT TYPE: Journal

LANGUAGE: English

AN 1986-10828 BIOTECHDS

AB Hybrids between *Solanum brevidens* and *Solanum tuberosum* (potato), obtained by protoplast fusion, were tested for late blight resistance and

potato-leaf-roll virus (PLRV) resistance. Hybrids, parental plants and Russet Burbank were sprayed with a suspension of zoospores and sporangia of *Phytophthora infestans* race 0 (incompatible with *S. tuberosum* PI 203900) or race 1.3.4.5 (compatible with all plants). In order to test PLRV resistance, 5 viruliferous aphids were confined on each plant for 5-6 days. Plants were assayed for the presence of PLRV in leaf tissue by ELISA. All fusion progeny inoculated with race 0 were significantly

less

necrotic than the *S. brevidens* parent and their level of resistance was similar to that of the *S. tuberosum* parent. The R4 resistance gene was functioning in all fusion progeny tested. After inoculation with the host-compatible race 1.3.4.5 all plants tested showed extensive necrosis and there was no significant difference in resistance between hybrids

and

parents. Clonal copies of 10 of the lines resistant to *P. infestans*

race

0 were be PLRV resistant. (15 ref)

BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.DUPLICATE 1

ACCESSION NUMBER: 1995:132104 BIOSIS

DOCUMENT NUMBER: PREV199598146404

TITLE: Identification of somatic hybrids of dihaploid *Solanum tuberosum* lines and *S. brevidens* by species **RAPD** patterns and assessment of disease resistance of the hybrids.

AUTHOR(S): Rokka, Veli-Matti (1); Xu, Yong-Sheng; Kankila, Jyri (1); Kuusela, Anja; Pulli, Seppo (1); Pehu, Eija

CORPORATE SOURCE: (1) Agric. Res. Cent., Inst. Crop Soil Sci., Plant Breeding

Sect., FIN-31600 Jokioinen Finland

SOURCE: Euphytica, (1994) Vol. 80, No. 3, pp. 207-217.
ISSN: 0014-2336.

DOCUMENT TYPE: Article

LANGUAGE: English

AB Symmetric somatic hybrids were produced by electrofusion of protoplasts of

two dihaploid tuber-bearing **potato** (*Solanum tuberosum* L.) lines and *Solanum brevidens* Phil., a diploid non-tuber-bearing wild **potato** species. A total of 985 **plants** was obtained. Verification of nuclear hybridity of putative hybrids was based on additive **RAPD** patterns, general morphological characteristics and chromosome counts. 53 (90%) calli regenerated into **plants** which were identified as somatic hybrids. Most of the hybrids were aneuploids at the tetraploid (4 times) or hexaploid (6 times) level.

The

20 hybrids tested expressed a high level of **resistance** to **potato** virus Y (PVY-N) characteristic of the *S. brevidens* parent. **Resistance** to late blight (*Phytophthora infestans* (Mont.) de Bary) varied between hybrids, but was on average better than that of the fusion parents. **Resistance** of hybrids to bacterial stem rot (*Erwinia carotovora* subsp. *atroseptica* (van Hall) Dye) was not superior to that of commercial **potato** cultivars.

L42 ANSWER 7 OF 7 BIOBUSINESS COPYRIGHT 2002 BIOSIS

ACCESSION NUMBER: 97:85994 BIOBUSINESS

DOCUMENT NUMBER: 0943529

TITLE: Production of somatic hybrids between *S. tuberosum* L. and **late blight resistant** Mexican wild potato species.

AUTHOR: Thieme R; Darsow U; Gavrilenko T; Dorokhov D; Tiemann H

CORPORATE SOURCE: Fed. Centre Breed. Res. Cultivated Plants, Inst. Breed. Crop Plants, 18190 Gross Luesewitz, Germany.

SOURCE: Euphytica, (1997) Vol.97, No.2, p.189-200.

ISSN: 0014-2336.

DOCUMENT TYPE: ARTICLE

FILE SEGMENT: NONUNIQUE

LANGUAGE: English

AB Interspecific somatic hybrids between dihaploid breeding clones of potato,

S. tuberosum and two accessions of wild Mexican species *S. pinnatisectum* and the hybrid line *S. pinnatisectum* times *S. bulbocastanum* were regenerated following electrofusion of mesophyll protoplasts to combine important agricultural traits of *S. tuberosum* and a high level of **late blight resistance** from selected wild accessions. In two fusion combinations 239 calli were regenerated; 162 from 195 calli analysed were identified as hybrids by means of isozyme analysis of peroxidases and, for some hybrid clones, by **RAPD** analysis. Depending on the fusion combination, 47-89 percent of the somatic hybrids had the expected ploidy level and 7-16 percent were mixoploids. Somatic hybrids were phenotypically intermediate as compared to their parents and some of them were able to be backcrossed sexually with potato. Fertility and crossability depended on combination and ploidy

level of the somatic hybrids. In tests with detached leaves the wild partner clones had a high **late blight resistance** score of 8,6 and 8,9; the susceptible *tuberosum*-partners of 2,8 and 3,5, respectively. Nearly 25 percent of somatic hybrids had a **resistance** level of 6 or higher in the first year of assessment. The average **resistance** value of most somatic hybrids was lower than the average parental level. The reasons for variation in **resistance** values are discussed in connection with the practical application of fusion hybrids.

reserved.

TITLE (IN ENGLISH): **Resistance to late blight**
 in *Solanum bulbocastanum* is mapped
 to chromosome 8

AUTHOR: NAESS S. K.; BRADEEN J. M.; WIELGUS S. M.; HABERLACH
 G. T.; MCGRATH J. M.; HELGESON J. P.

CORPORATE SOURCE: USDA/ARS Plant Disease Resistance Research Unit,
 Department of Plant Pathology, University of
 Wisconsin, Madison, WI 53706, United States

SOURCE: Theoretical and Applied Genetics, (2000), 101(5-6),
 697-704, 34 refs.
 ISSN: 0040-5752 CODEN: THAGA6

DOCUMENT TYPE: Journal

BIBLIOGRAPHIC LEVEL: Analytic

COUNTRY: Germany, Federal Republic of

LANGUAGE: English

AVAILABILITY: INIST-395, 354000092512170040

AN 2000-0525204 PASCAL

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AB Somatic hybrids between potato and *Solanum*
 bulbocastanum, a wild diploid (2n=2x=24) Mexican species, are
 highly **resistant to late blight**, caused by
 Phytophthora infestans. Both randomly amplified polymorphic DNA (**RAPD**) and restriction fragment length polymorphism (RFLP) markers
 that are closely linked to the **resistance** have been noted by
 analysis of three different backcross-2 populations derived from two
 different somatic hybrids. With reference to previously published potato
 and tomato maps, **resistance** appears to be on the long arm of
 chromosome 8 and is flanked by RFLP markers CP53 and CT64. In a
 population of BC.sub.2 plants derived from a cross between the BC.sub.1
 line J101K6 [(*S. tuberosum* PI 203900+*S. bulbocastanum* PI
 243510) xKatahdin] x Atlantic, **late blight**
 resistance cosegregated with RFLP marker CT88 and **RAPD**
 marker OPG02-625.

=>

: ZT574

TITLE: Somatic hybrids between *Solanum bulbocastanum* and potato: a new source of resistance to late blight

AUTHOR: Helgeson J P (Reprint); Pohlman J D; Austin S; Haberlach G

T; Wielgus S M; Ronis D; Zambolim L; Tooley P; McGrath J M; James R V; Stevenson W R

CORPORATE SOURCE: UNIV WISCONSIN, DEPT PLANT PATHOL, USDA ARS, PLANT DIS RESISTANCE RES UNIT, MADISON, WI 53706 (Reprint)

COUNTRY OF AUTHOR: USA

SOURCE: THEORETICAL AND APPLIED GENETICS, (MAY 1998) Vol. 96, No. 6-7, pp. 738-742.
Publisher: SPRINGER VERLAG, 175 FIFTH AVE, NEW YORK, NY 10010.
ISSN: 0040-5752.

DOCUMENT TYPE: Article; Journal

FILE SEGMENT: LIFE; AGRI

LANGUAGE: English

REFERENCE COUNT: 15

ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

AB *Solanum bulbocastanum*, a wild, diploid ($2n = 2x = 24$) Mexican species, is highly resistant to *Phytophthora infestans*, the fungus that causes late blight of potato. However this 1 EBN species is virtually impossible to cross directly with potato. PEG-mediated fusion of leaf cells of *S. bulbocastanum* PI 245310 and the tetraploid potato line *S. tuberosum* PI 203900 ($2n = 4x = 48$) yielded hexaploid ($2n = 6x = 72$) somatic hybrids that retained the high resistance of the *S. bulbocastanum* parent. RFLP and RAPD analyses confirmed the hybridity of the materials. Four of the somatic hybrids were crossed with potato cultivars Katahdin or Atlantic. The BC1 progeny segregated for resistance to the US8 genotype (A-2 mating type) of *P. Infestans*. Resistant BC1 lines crossed with susceptible cultivars again yielded populations that segregated for resistance to the fungus. In a 1996 field-plot in Wisconsin, to which no fungicide was applied? two of the BC1 lines, from two different somatic hybrids, yielded 1.36 and 1.32 kg/plant under a severe late-blight epidemic. In contrast, under these same conditions the cultivar Russet Burbank yielded only 0.86 kg/plant. These results indicate that effective resistance to the late-blight fungus in a sexually incompatible *Solanum* species can be transferred into potato breeding lines by somatic hybridization and that this resistance can then be further transmitted into potato breeding lines by sexual crossing.

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DB=DWPI,USPT; PLUR=YES; OP=ADJ

L1 Helgeson-J\$ 4 L1

L2 Helgeson-j\$.in. or Austin-phillips-s\$.in. or Naess-S\$.in. 14 L2

DB=USPT,DWPI; PLUR=YES; OP=ADJ

L3 late blight resist\$ 1 L3

L4 late blight and resist\$ 245 L4

L5 solanum bulbocastanum 1 L5

L6 potato and bulbocastanum 1 L6

L7 soft rot or Erwinia or Verticillium 4443 L7

L8 l4 and l7 68 L8

L9 L8 and l4 68 L9

L10 L9 and l2 0 L10

L11 l9 and chromosome 8 0 L11

L12 chromosom\$ and l9 5 L12

L13 marker and (RADP or CT88 or CT148 or CT252 or CT68) 0 L13

L14 (RADP or CT88 or CT148 or CT252 or CT68) 10 L14

L15 L14 and l9 0 L15

L16 l9 and l7 68 L16

L17 l16 and vector 14 L17

L18 l14 and hybridiz\$ 0 L18

L19 somatic hybridization 120 L19

DB=USPT,PGPB,DWPI; PLUR=YES; OP=ADJ

L20 L19 and l9 1 L20

END OF SEARCH HISTORY